



Complete Summary

TITLE

Venous thromboembolism (VTE): percent of patients diagnosed with confirmed VTE during hospitalization (not present on arrival) who did not receive VTE prophylaxis between hospital admission and the day before the VTE diagnosis testing order date.

SOURCE(S)

Specifications manual for national hospital inpatient quality measures, version 3.0b. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2009 Oct. various p.

Measure Domain

PRIMARY MEASURE DOMAIN

Process

The validity of measures depends on how they are built. By examining the key building blocks of a measure, you can assess its validity for your purpose. For more information, visit the [Measure Validity](#) page.

SECONDARY MEASURE DOMAIN

Does not apply to this measure

Brief Abstract

DESCRIPTION

This measure* is used to assess the percent of patients diagnosed with confirmed venous thromboembolism (VTE) during hospitalization (not present on arrival) who did not receive VTE prophylaxis between hospital admission and the day before the VTE diagnosis testing order date.

*This is a Joint Commission only measure.

RATIONALE

The concept of "failure to prevent" has generated interest in national health policy organizations to identify evidence-based practice that will improve patient safety in the hospital setting. In spite of formal guidelines, pulmonary embolism is the

most common preventable cause of death among hospitalized patients, causing or contributing to 5% to 10% of all in-hospital deaths.Â A study at a large teaching hospital found that potentially preventable cases of venous thromboembolism (VTE) represented two-thirds of all VTE cases where prophylaxis was indicated, with 47.7% due to failure to give any prophylaxis, 22.7% because of inadequate duration or 20% due to incorrect type of prophylaxis.Â Almost one-half of all VTEs occurring in the community are related to recent hospitalization, either for major surgery or for acute medical illness.

Gillies and colleagues identified three groups of surgical patients less likely to receive prophylaxis: moderate-risk patients, emergency admission, and conservatively treated patients.Â Failure to prevent VTE can result in delayed hospital discharge or readmission, increased risk for long-term morbidity from post-thrombotic syndrome, and recurrent thrombosis in the future.

PRIMARY CLINICAL COMPONENT

Venous thromboembolism (VTE); prevention

DENOMINATOR DESCRIPTION

Patients who developed confirmed venous thromboembolism (VTE) during hospitalization (see the related "Denominator Inclusions/Exclusions" field in the Complete Summary)

NUMERATOR DESCRIPTION

Patients who received no venous thromboembolism (VTE) prophylaxis prior to the VTE diagnostic test order date

Evidence Supporting the Measure

EVIDENCE SUPPORTING THE CRITERION OF QUALITY

- A clinical practice guideline or other peer-reviewed synthesis of the clinical evidence
- One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

NATIONAL GUIDELINE CLEARINGHOUSE LINK

- [Prevention of venous thromboembolism. American College of Chest Physicians evidence-based clinical practice guidelines \(8th edition\).](#)

Evidence Supporting Need for the Measure

NEED FOR THE MEASURE

Use of this measure to improve performance

EVIDENCE SUPPORTING NEED FOR THE MEASURE

Arnold DM, Kahn SR, Shrier I. Missed opportunities for prevention of venous thromboembolism: an evaluation of the use of thromboprophylaxis guidelines. Chest 2001 Dec;120(6):1964-71.

Baglin TP, White K, Charles A. Fatal pulmonary embolism in hospitalised medical patients. J Clin Pathol 1997 Jul;50(7):609-10. [PubMed](#)

Geerts WH, Bergqvist D, Pineo GF, Heit JA, Samama CM, Lassen MR, Colwell CW. Prevention of venous thromboembolism: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition). Chest 2008 Jun;133(6 Suppl):381S-453S. [728 references] [PubMed](#)

Gillies TE, Ruckley CV, Nixon SJ. Still missing the boat with fatal pulmonary embolism. Br J Surg 1996 Oct;83(10):1394-5. [PubMed](#)

Heit JA, O'Fallon WM, Petterson TM, Lohse CM, Silverstein MD, Mohr DN, Melton LJ 3rd. Relative impact of risk factors for deep vein thrombosis and pulmonary embolism: a population-based study. Arch Intern Med 2002 Jun 10;162(11):1245-8. [PubMed](#)

State of Use of the Measure

STATE OF USE

Current routine use

CURRENT USE

Accreditation
Collaborative inter-organizational quality improvement
Internal quality improvement

Application of Measure in its Current Use

CARE SETTING

Hospitals

PROFESSIONALS RESPONSIBLE FOR HEALTH CARE

Measure is not provider specific

LOWEST LEVEL OF HEALTH CARE DELIVERY ADDRESSED

Single Health Care Delivery Organizations

TARGET POPULATION AGE

Age greater than or equal to 18 years

TARGET POPULATION GENDER

Either male or female

STRATIFICATION BY VULNERABLE POPULATIONS

Unspecified

Characteristics of the Primary Clinical Component

INCIDENCE/PREVALENCE

In spite of formal guidelines, pulmonary embolism is the most common preventable cause of death among hospitalized patients causing or contributing to 5% to 10% of all in-hospital deaths. A study at a large teaching hospital found that potentially preventable cases of venous thromboembolism (VTE) represented two thirds of all VTE cases where prophylaxis was indicated with 47.7% due to failure to give any prophylaxis, 22.7% because of inadequate duration or 20% due to incorrect type of prophylaxis. Almost one-half of all VTE occurring in the community is related to recent hospitalization, either for major surgery or for acute medical illness. Patients with secondary deep vein thrombosis (DVT) (DVT developed during hospitalization after admission for another medical condition) has a gross mortality of 43%, compared to a gross mortality of 3% for primary DVT (admitted for confirmed DVT).

EVIDENCE FOR INCIDENCE/PREVALENCE

Arnold DM, Kahn SR, Shrier I. Missed opportunities for prevention of venous thromboembolism: an evaluation of the use of thromboprophylaxis guidelines. Chest 2001 Dec;120(6):1964-71.

Baglin TP, White K, Charles A. Fatal pulmonary embolism in hospitalised medical patients. J Clin Pathol 1997 Jul;50(7):609-10. [PubMed](#)

Heit JA, O'Fallon WM, Petterson TM, Lohse CM, Silverstein MD, Mohr DN, Melton LJ 3rd. Relative impact of risk factors for deep vein thrombosis and pulmonary embolism: a population-based study. Arch Intern Med 2002 Jun 10;162(11):1245-8. [PubMed](#)

Leong WA. Outpatient treatment of deep vein thrombosis: operational considerations. In: Ansell JE, Oertel LB, Wittkowsky AK, editor(s). Managing oral anticoagulation therapy. Clinical and operational guidelines. Vol. 54 Gaithersburg (MD): Aspen Publishers, Inc.; 1997. p. 1995-9.

ASSOCIATION WITH VULNERABLE POPULATIONS

Gillies and colleagues identified three groups of surgical patients less likely to receive prophylaxis: moderate-risk patients, emergency admissions and

conservatively treated patients. In a study by Goldhaber, 48% of patients had received no prophylaxis prior to developing venous thromboembolism (VTE), 110 were admitted to medical services (general medicine and medical oncology) and 73 were admitted to surgical services that included general, thoracic, and cardiac surgery, orthopedics, gynecology, obstetrics, surgical gastroenterology and renal transplant. Both genders were affected similarly and secondary VTE occurred in a wide age of patients.

EVIDENCE FOR ASSOCIATION WITH VULNERABLE POPULATIONS

Gillies TE, Ruckley CV, Nixon SJ. Still missing the boat with fatal pulmonary embolism. *Br J Surg*1996 Oct;83(10):1394-5. [PubMed](#)

Goldhaber SZ, Dunn K, MacDougall RC. New onset of venous thromboembolism among hospitalized patients at Brigham and Women's Hospital is caused more often by prophylaxis failure than by withholding treatment. *Chest*2000 Dec;118(6):1680-4. [PubMed](#)

BURDEN OF ILLNESS

It has been estimated that approximately 1 out of 20 hospitalized medical patients will suffer a fatal pulmonary embolism (PE) if they have not received appropriate thrombosis prophylaxis. PE is the third most common cause of hospital-related death in the US. Even though pharmacological and mechanical interventions have been shown to be effective, only one-third of all patients at risk for venous thromboembolism (VTE) actually receive any prophylaxis. There are numerous studies that cite that VTE prophylaxis is underutilized; there is strong scientific evidence that prophylaxis reduces the risk for deep vein thrombosis (DVT) in asymptomatic patients and the risk for PE in surgical patients and reduces mortality in conjunction with surgery.

EVIDENCE FOR BURDEN OF ILLNESS

Baglin TP, White K, Charles A. Fatal pulmonary embolism in hospitalised medical patients. *J Clin Pathol*1997 Jul;50(7):609-10. [PubMed](#)

Gillies TE, Ruckley CV, Nixon SJ. Still missing the boat with fatal pulmonary embolism. *Br J Surg*1996 Oct;83(10):1394-5. [PubMed](#)

Heit JA, Cohen AT, Anderson FA Jr, et al. Estimated annual number of incident and recurrent, non-fatal and fatal venous thromboembolism (VTE) events in the US. *Blood*2005;106:Abstract 910.

Prevention, diagnosis, and treatment of venous thromboembolism. *Int J Technol Assess Health Care*2003 Summer;19(3):573-84. [PubMed](#)

UTILIZATION

Prophylactic practices vary by local and individual preference.

EVIDENCE FOR UTILIZATION

Hyers TM. Management of venous thromboembolism: past, present, and future. Arch Intern Med 2003 Apr 14;163(7):759-68. [98 references] [PubMed](#)

COSTS

Unspecified

Institute of Medicine National Healthcare Quality Report Categories

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness
Safety
Timeliness

Data Collection for the Measure

CASE FINDING

Users of care only

DESCRIPTION OF CASE FINDING

Patients, age 18 years and older, who developed confirmed venous thromboembolism (VTE) during hospitalization (see the "Denominator Inclusions/Exclusions" field)

DENOMINATOR SAMPLING FRAME

Patients associated with provider

DENOMINATOR INCLUSIONS/EXCLUSIONS

Inclusions

Patients who developed confirmed venous thromboembolism (VTE) during hospitalization

Include discharges with an *International Classification of Disease, Ninth Revisions, Clinical Modification (ICD-9-CM) Other Diagnosis Codes* of VTE as defined in Appendix A, Table 7.03 or 7.04 of the original measure documentation

Exclusions

- Patients less than 18 years of age
- Patients who have a length of stay (LOS) greater than 120 days

- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients with *ICD-9-CM Principal Diagnosis Code* of VTE as defined in Appendix A, Table 7.03 or 7.04
- Patients with *VTE Present on Arrival*
- Patients with reasons for not administering mechanical and pharmacologic prophylaxis
- Patients without VTE confirmed by diagnostic testing

RELATIONSHIP OF DENOMINATOR TO NUMERATOR

All cases in the denominator are equally eligible to appear in the numerator

DENOMINATOR (INDEX) EVENT

Clinical Condition
Diagnostic Evaluation
Institutionalization

DENOMINATOR TIME WINDOW

Time window brackets index event

NUMERATOR INCLUSIONS/EXCLUSIONS

Inclusions

Patients who received no venous thromboembolism (VTE) prophylaxis prior to the VTE diagnostic test order date

Exclusions

None

MEASURE RESULTS UNDER CONTROL OF HEALTH CARE PROFESSIONALS, ORGANIZATIONS AND/OR POLICYMAKERS

The measure results are somewhat or substantially under the control of the health care professionals, organizations and/or policymakers to whom the measure applies.

NUMERATOR TIME WINDOW

Institutionalization

DATA SOURCE

Administrative data
Medical record

LEVEL OF DETERMINATION OF QUALITY

Individual Case

PRE-EXISTING INSTRUMENT USED

Unspecified

Computation of the Measure

SCORING

Rate

INTERPRETATION OF SCORE

Better quality is associated with a lower score

ALLOWANCE FOR PATIENT FACTORS

Unspecified

STANDARD OF COMPARISON

External comparison at a point in time
External comparison of time trends
Internal time comparison

Evaluation of Measure Properties

EXTENT OF MEASURE TESTING

This measure has undergone a rigorous process of public comment and two phases (alpha and pilot [beta]) of testing that included reliability testing.Â The pilot specifications and algorithms were tested at over 40 hospitals (5,713 cases) for six months during 2007.

EVIDENCE FOR RELIABILITY/VALIDITY TESTING

Information about the Candidate Voluntary Consensus Standards for Hospital Care, additional priorities, 2007, detailed performance measure evaluation [unpublished].

Identifying Information

ORIGINAL TITLE

VTE-6: incidence of potentially-preventable venous thromboembolism.

MEASURE COLLECTION

[National Hospital Inpatient Quality Measures](#)

MEASURE SET NAME

[Venous Thromboembolism \(VTE\)](#)

SUBMITTER

Centers for Medicare & Medicaid Services
Joint Commission, The

DEVELOPER

Centers for Medicare & Medicaid Services/The Joint Commission

FUNDING SOURCE(S)

All external funding for measure development has been received and used in full compliance with The Joint Commission's Corporate Sponsorship policies, which are available upon written request to The Joint Commission.

COMPOSITION OF THE GROUP THAT DEVELOPED THE MEASURE

Technical advisory panel of stakeholders. The list of participants is available at <http://www.jointcommission.org/NR/rdonlyres/1A4DF024-92D7-42D0-B997-348193843D89/0/VTETechnicalAdvisoryPanel.pdf>.

FINANCIAL DISCLOSURES/OTHER POTENTIAL CONFLICTS OF INTEREST

Expert panel members have made full disclosure of relevant financial and conflict of interest information in accordance with the Joint Commission's Conflict of Interest policies, copies of which are available upon written request to The Joint Commission.

ENDORSER

National Quality Forum

ADAPTATION

Measure was not adapted from another source.

RELEASE DATE

2009 Oct

MEASURE STATUS

This is the current release of the measure.

SOURCE(S)

Specifications manual for national hospital inpatient quality measures, version 3.0b. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2009 Oct. various p.

MEASURE AVAILABILITY

The individual measure, "VTE-6: Incidence of Potentially-Preventable Venous Thromboembolism," is published in "Specifications Manual for National Hospital Inpatient Quality Measures." This document is available from [The Joint Commission Web site](#). Information is also available from the [Centers for Medicare & Medicaid Services \(CMS\) Web site](#). Check The Joint Commission Web site and CMS Web site regularly for the most recent version of the specifications manual and for the applicable dates of discharge.

NQMC STATUS

The Joint Commission submitted this NQMC measure summary to ECRI Institute on September 18, 2009. This NQMC summary was reviewed accordingly by ECRI Institute on November 10, 2009.

COPYRIGHT STATEMENT

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